



GLOBE IVSS 2026

Princess Chulabhorn Science High School Chonburi



# A Study on the Effects of Salinity on Phytoplankton Community Structure for Monitoring Algal Blooms in Coastal Areas of Mueang Chon Buri, Chon Buri, Thailand.

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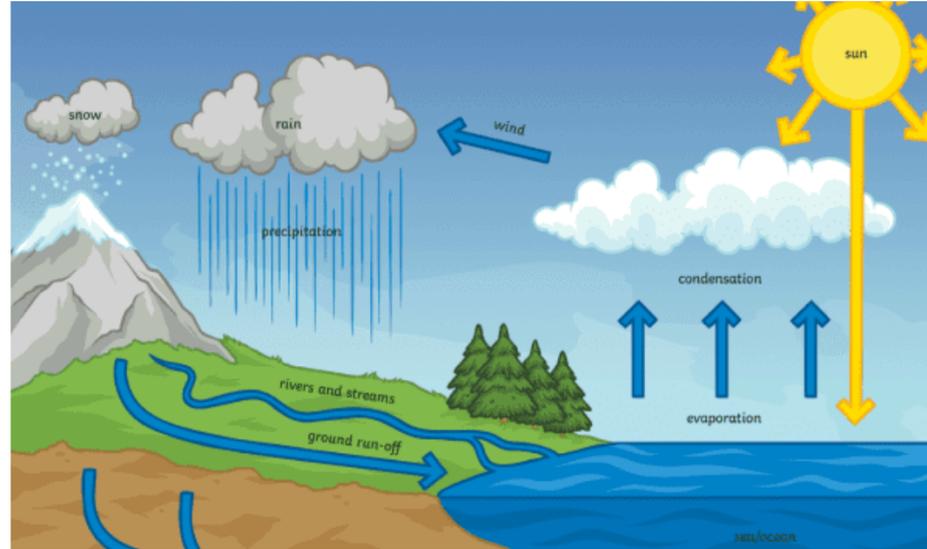
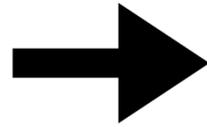


## Introduction



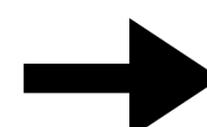
Climate Change

Erratic weather patterns and extreme precipitation events



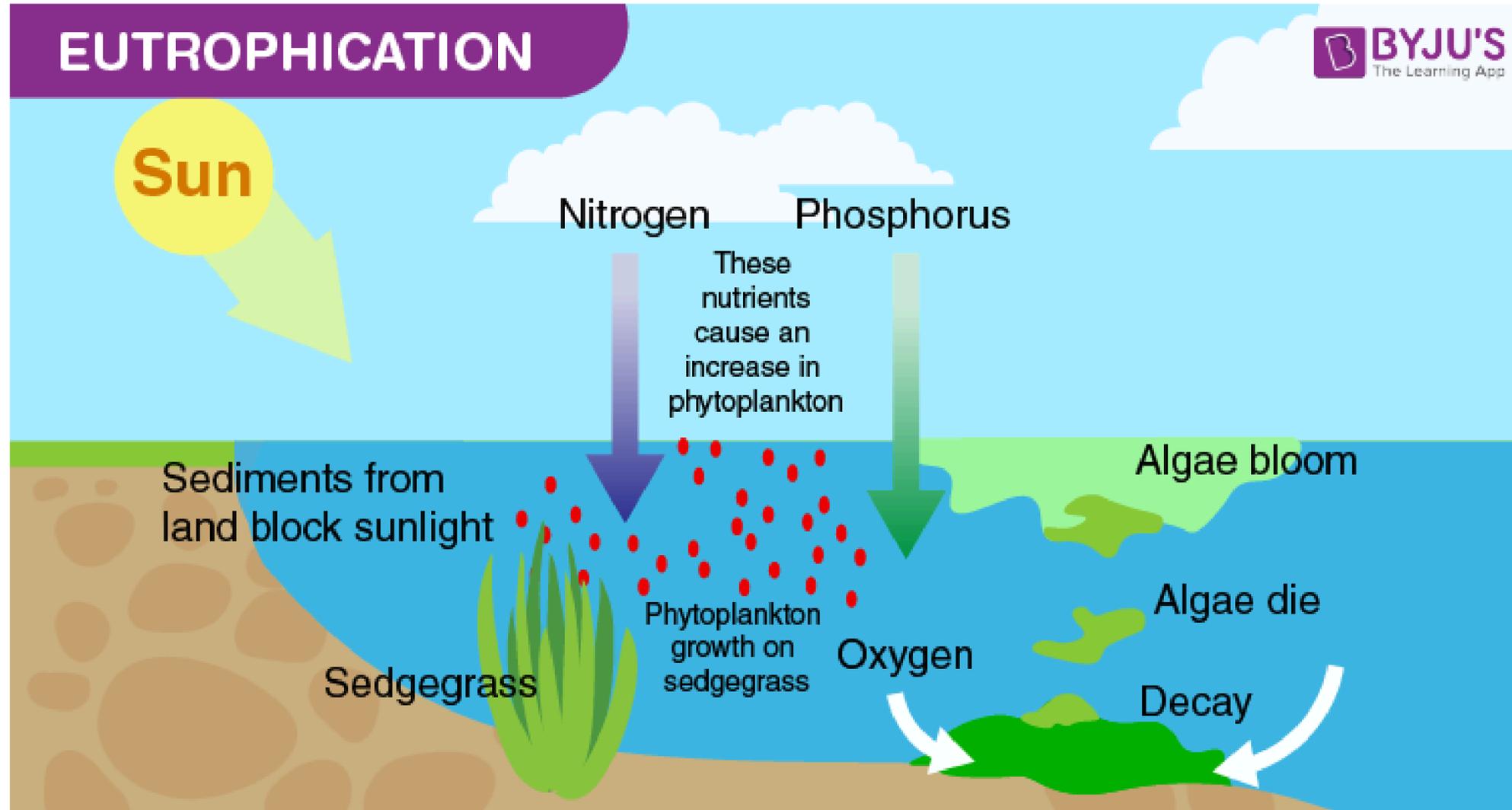
Freshwater Runoff

Massive influx causing "Rapid Freshening" of coastal water.



Salinity Stress & Stratification

Triggers Osmotic Shock, acting as a natural filter for sensitive species.

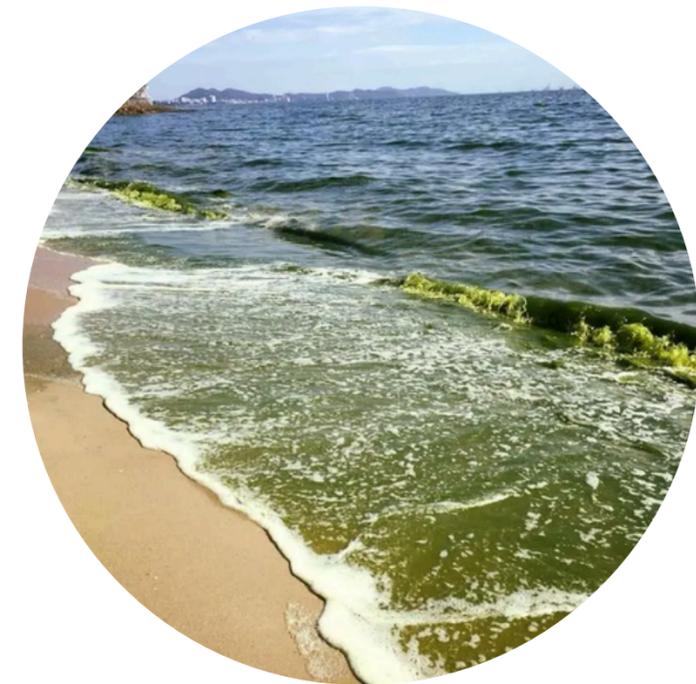


Tolerant species takeover,  
leading to Harmful Algal  
Blooms (HABs)



## Objectives

To investigate the effect of **salinity** on **phytoplankton** community structure in the coastal area of Bang Saen, Chon Buri.





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## Ang Sila Station

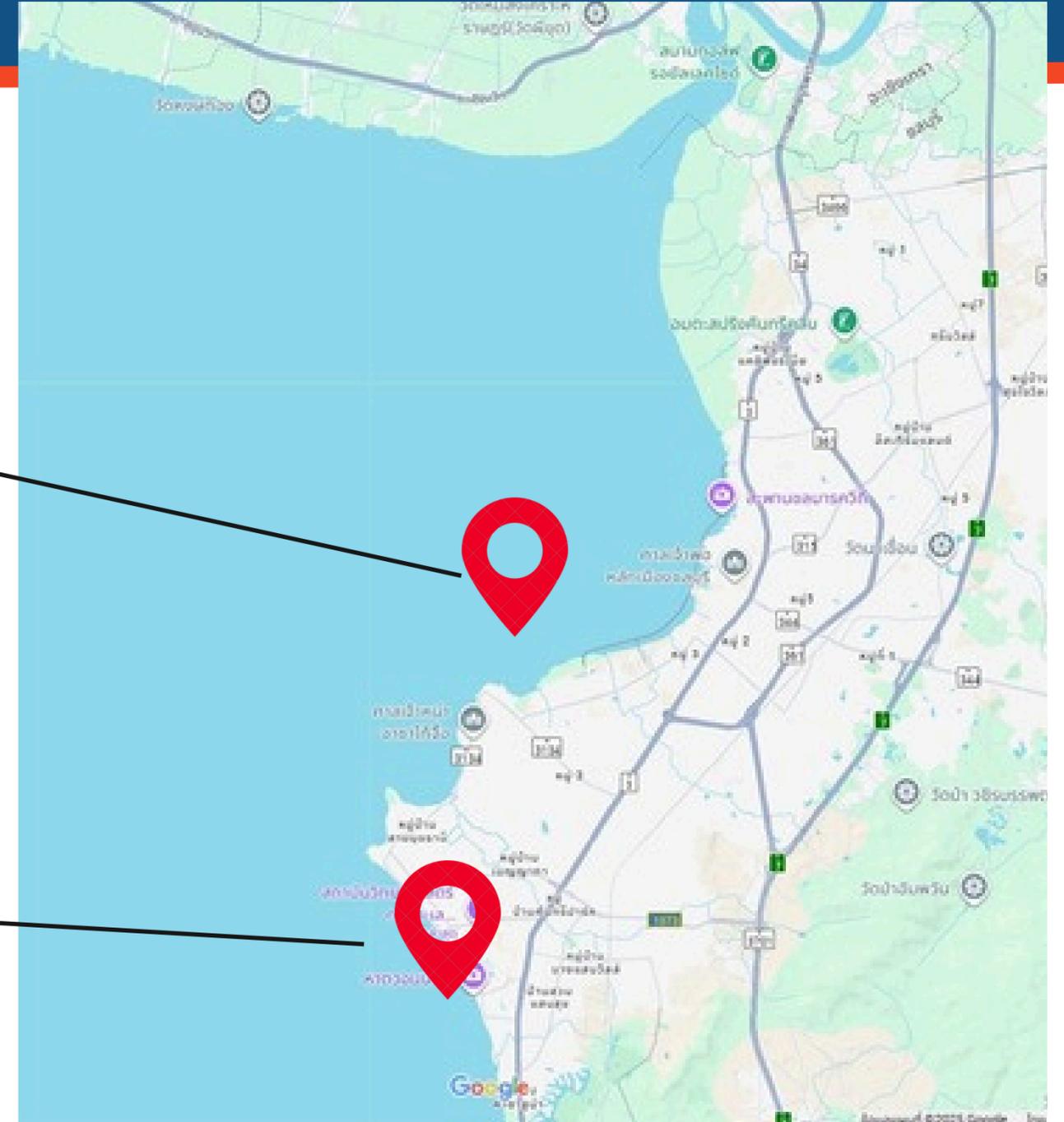


latitude 13.3384 °N  
longitude 100.9204 °E

## Wonnapha Beach Station

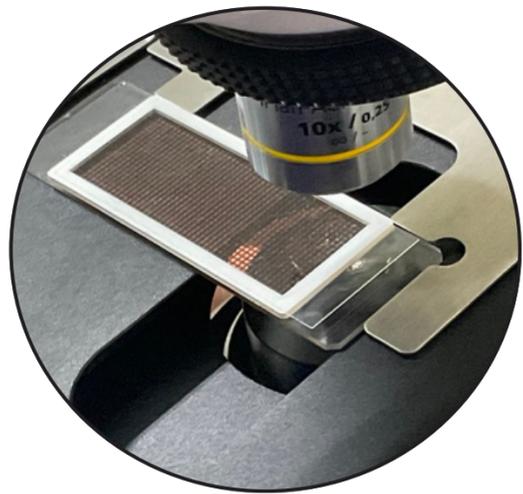


latitude 13.2680 °N  
longitude 100.9202 °E





Methodology : Materials and Equipment



(Sedgwick rafter cell)



Multi - parameter



20-micron plankton net



secchi disk



## Methodology : Field Sampling



A 10-liter water sample was collected.

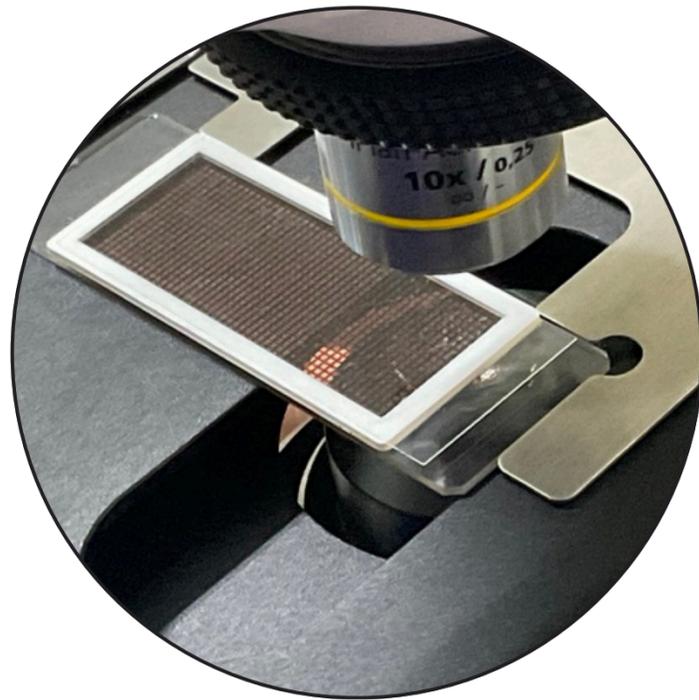
Water quality parameters

Filtered through a plankton net

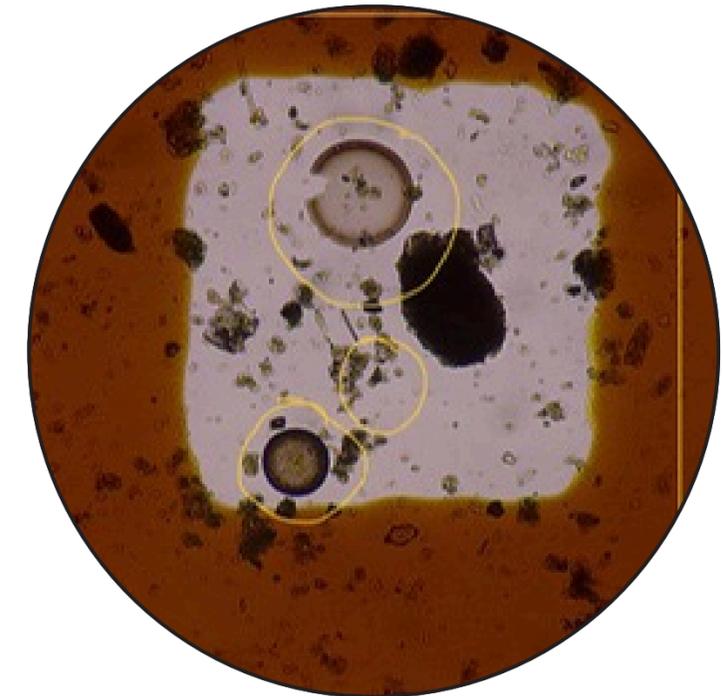
Water transparency was measured using a standard Secchi disk



# Phytoplankton Cell Count:



1 ml



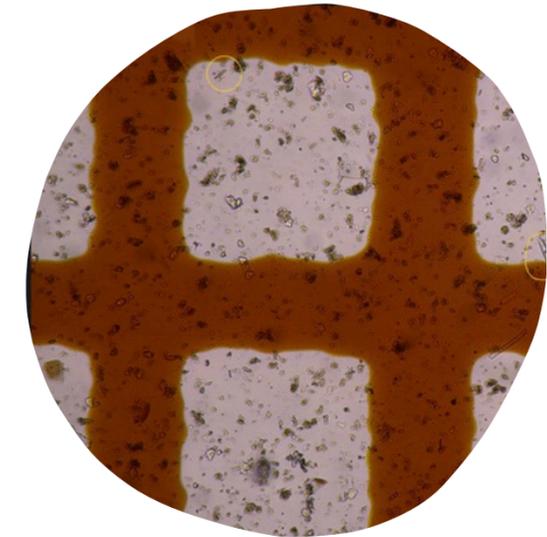
Phytoplankton Cell Count:



## Fomula

## Sedgewick rafter

$$C = \frac{N \times V_2}{V_1}$$



### Where:

- $C$  represents the **phytoplankton density** (cells/L).
- $N$  is the **average cell count** per milliliter.
- $V_1$  is the **total volume of filtered water** (L).
- $V_2$  is the **final volume of the concentrated sample** (mL).



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## Results

Date	Station	Temp	pH	DO mg/L	TDS /ss	P. Density	Salinity	Translucent
7 Aug.	Ang Sila	32.8	8.13	6.75	11.91	19,540.00	14.26	1.00
7 Aug.	Wonnapha	31.8	8.60	9.00	15.09	14,140.00	18.53	1.30
2 Sept.	Ang Sila	31.53	9.00	12.75	96.58	338,025.00	11.55	1.20
2 Sept.	Wonnapha	31.09	8.50	8.50	14.46	941,750.00	17.72	1.40
9 Sept.	Ang Sila	32.09	8.55	6.70	18.32	3,750.00	22.93	1.00
9 Sept.	Wonnapha	32.00	8.50	7.00	17.60	3,520.00	21.97	1.80
28 Oct.	Ang Sila	29.20	8.00	7.50	21.50	27,083.00	29.00	0.90
28 Oct.	Wonnapha	29.70	8.40	5.00	24.27	14,375.00	31.00	1.70
5 Nov.	Ang Sila	30.83	8.00	8.37	23.21	19,333.00	29.95	1.10
5 Nov.	Wonnapha	30.42	8.50	8.50	24.55	6,375.00	31.91	1.50
12 Nov.	Ang Sila	32.65	9.00	12.50	18.99	52,125.00	23.88	1.00
12 Nov.	Wonnapha	32.12	8.81	10.00	20.51	48,125.00	26.05	1.30

Water quality parameters along the coastal areas of Bang Saen, Chonburi Province.



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## Results

### Ang Sila

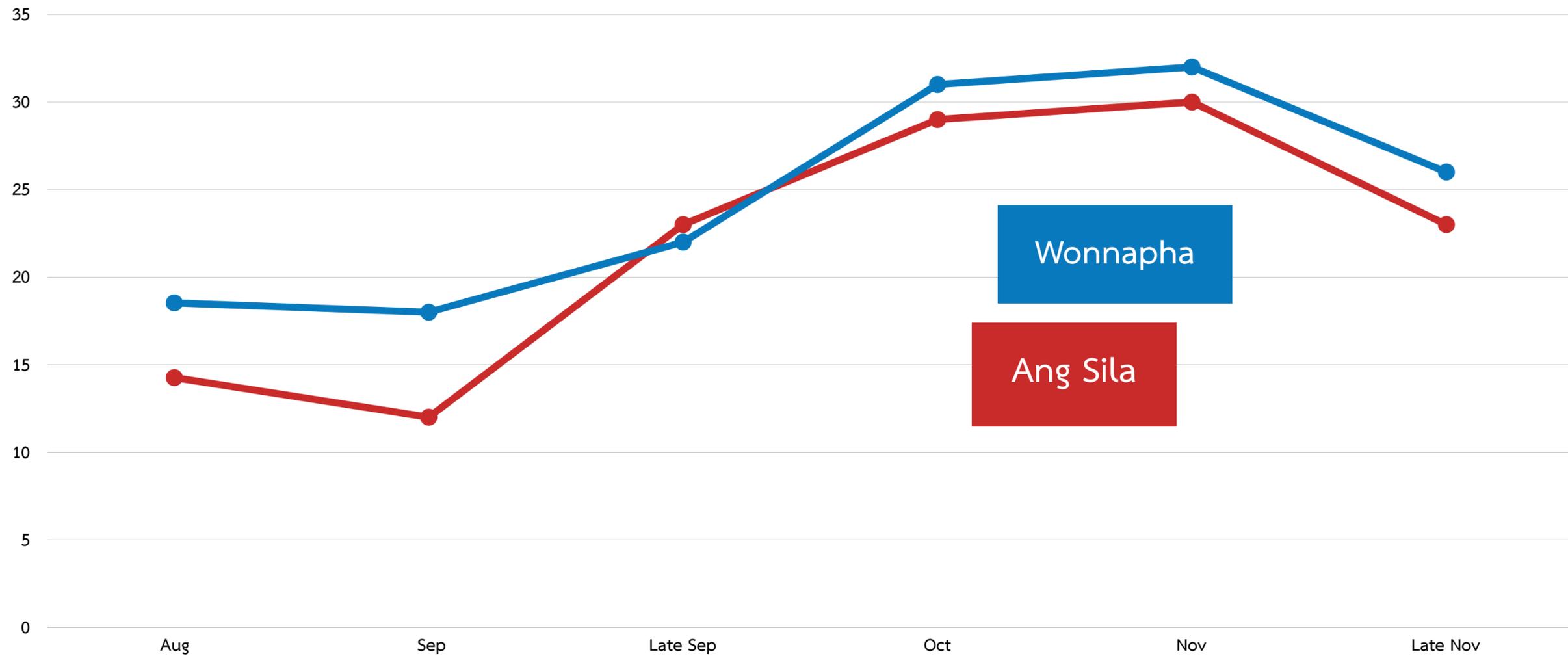
### Wonnapha

Date	Genus	Species	Density (Cell/L)	Date	Genus	Species	Density (Cell/L)
7 Aug.	Dinoflagellates	Chaetoceros spp.	12,250	7 Aug.	Dinoflagellates	Ceratium furca	5,250
7 Aug.	Diatom	Rhizosolenia spp.	5,000	7 Aug.	Diatom	Coscinodiscus spp.	3,250
7 Aug.	Diatom	Coscinodiscus spp.	1,750	7 Aug.	Diatom	Rhizosolenia spp.	1,750
2 Sept.	Dinoflagellates	Ceratium furca	31,000	2 Sept.	Dinoflagellates	Ceratium furca	94,750
2 Sept.	Diatom	Coscinodiscus spp.	4,750	2 Sept.	Diatom	Coscinodiscus spp.	1,250
9 Sept.	Diatom	Rhizosolenia spp.	1,750	9 Sept.	Diatom	Coscinodiscus spp.	1,300
9 Sept.	Diatom	Thalassiosira spp.	1,750	9 Sept.	Dinoflagellates	Ceratium furca	500
9 Sept.	Diatom	Coscinodiscus spp.	1,000	9 Sept.	Diatom	Thalassiosira spp.	250
28 Oct.	Diatom	Navicula spp.	10,000	28 Oct.	Diatom	Navicula spp.	3,450
28 Oct.	Diatom	Surirella spp.	750	28 Oct.	Diatom	Surirella spp.	750
28 Oct.	Dinoflagellates	Chaetoceros spp.	750	28 Oct.	Diatom	Thalassiosira spp.	250
5 Nov.	Diatom	Rhizosolenia spp.	27,750	5 Nov.	Diatom	Rhizosolenia spp.	5,250
5 Nov.	Diatom	Thalassiosira spp.	875	5 Nov.	Diatom	Pleurosigma spp.	1,250
5 Nov.	Dinoflagellates	Ceratium furca	750	5 Nov.	Diatom	Thalassiosira spp.	500
12 Nov.	Diatom	Rhizosolenia spp.	26,875	12 Nov.	Diatom	Rhizosolenia spp.	29,375
12 Nov.	Dinoflagellates	Chaetoceros spp.	21,375	12 Nov.	Dinoflagellates	Chaetoceros spp.	17,250
12 Nov.	Dinoflagellates	Ceratium furca	3,875	12 Nov.	Dinoflagellates	Ceratium furca	1,500

Phytoplankton species composition and cell density (cells/L) at different sampling sites.



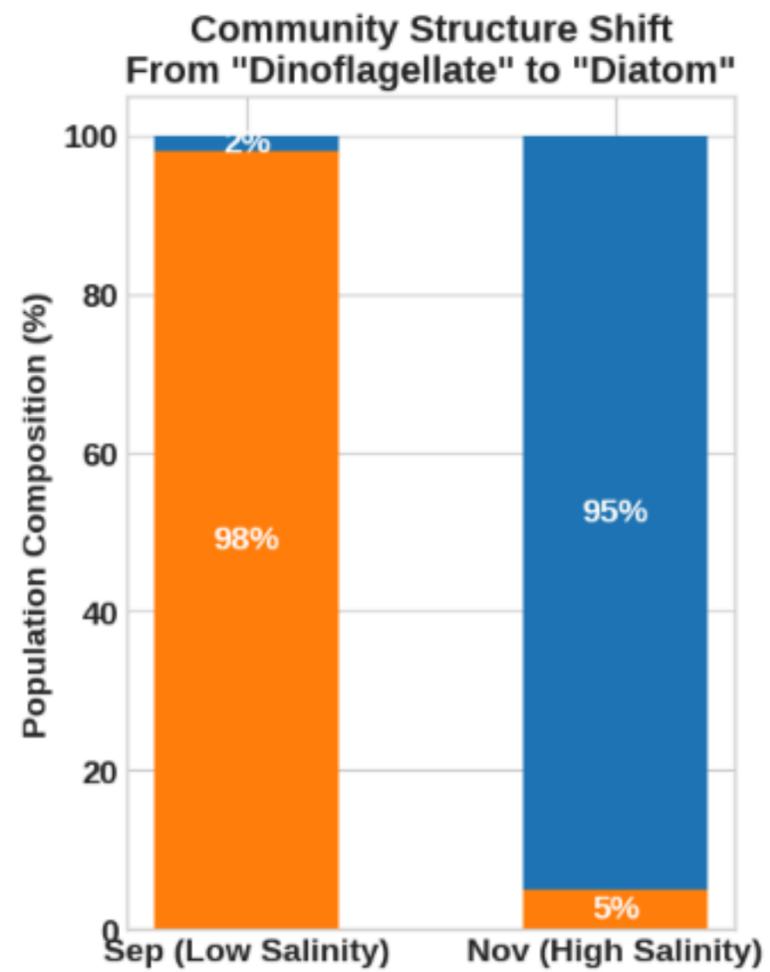
## Results



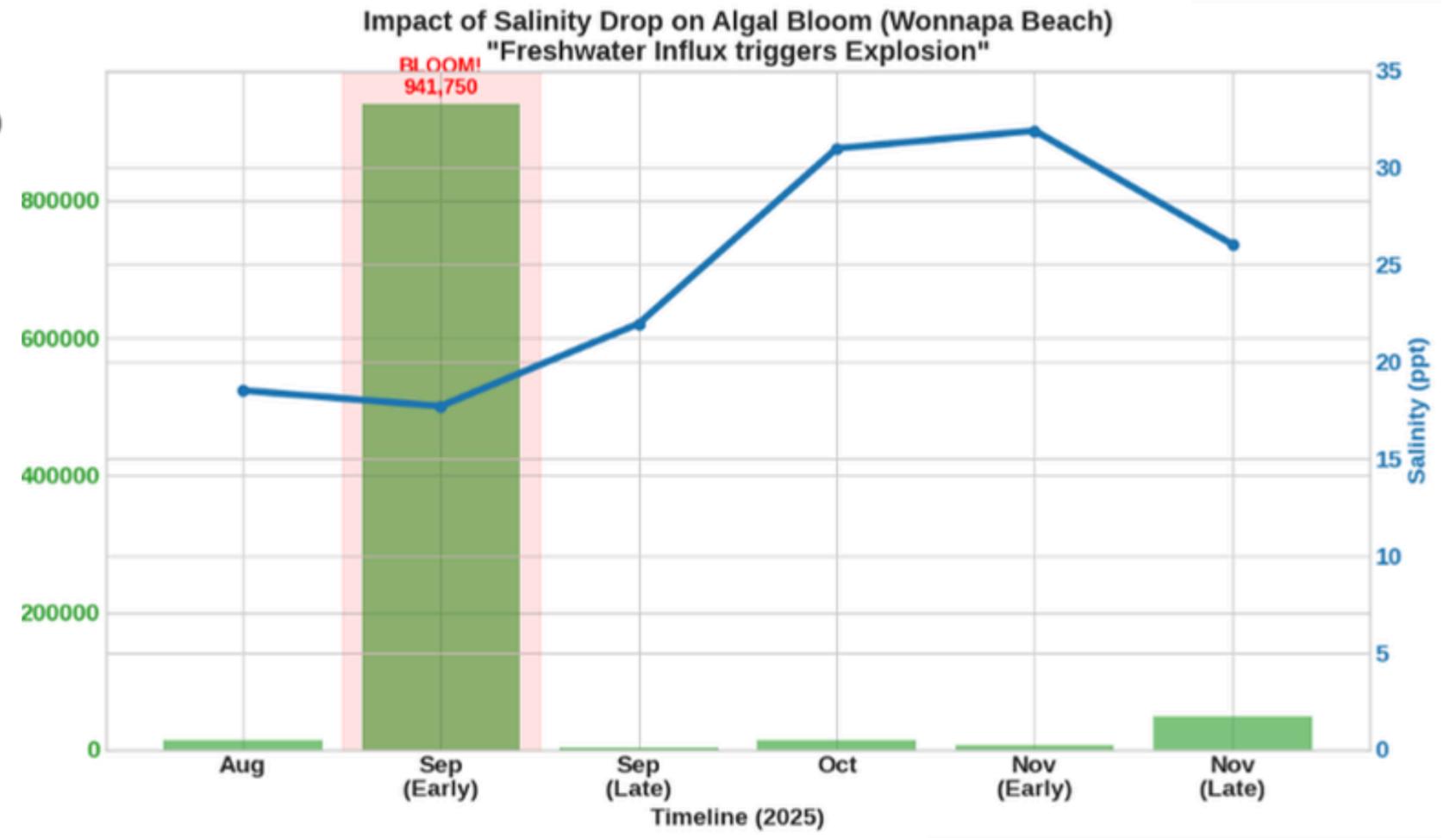
Comparison of salinity levels across different sampling stations.



## Results



- Dinoflagellate (Ceratium)
- Diatom (Rhizosolenia)





## Conclusion

### Environmental Drivers

1. General Conditions: Temp (29-32°C) & pH (8.1-9.0) were suitable for growth.
2. Key Event (September):
  - Heavy Rainfall -----> Freshwater Runoff.
  - Salinity Dropped Significantly (Low: 11.55 PSU).
  - High DO & pH observed (High Photosynthesis).

### Biological Response

Ang Sila (River Mouth / Stress Area):

- Status: Monodominance (Low Diversity).
- Dominant Species: *Ceratium furca*, *Chaetoceros* spp.
- Reason: Only tolerant species survived the salinity stress.

Wonnapha Beach (Open Coast / Stable Area):

- Status: High Diversity & Ecosystem Resilience.
- Succession: *Ceratium* ---> *Coscinodiscus* ---> *Navicula*.
- Reason: Stable salinity supported a diverse community.

## Summary

"Salinity fluctuations act as a primary environmental filter, determining whether the ecosystem remains diverse or shifts towards Monodominance."